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You can read the recommendations in the user guide, the technical guide or the installation guide for ASUS P8Z77-V PRO. You'll find the answers to all your questions on the ASUS P8Z77-V PRO in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

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**P8Z77-V
PRO**

ASUS

Motherboard



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Manual abstract:

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4-29 Installing the RAID driver during Windows® OS installation . 5-1 Installing two CrossFireXTM graphics cards . 5-4 Installing two SLI-ready graphics cards . To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system. When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected.

If possible, disconnect all power cables from the existing system before you add a device. Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged. seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit. Ensure that your power supply is set to the correct voltage in your area.

If you are not sure about the voltage of the electrical outlet you are using, contact your local power company. If the power supply is broken, do not try to fix it by yourself. Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package. Before using the product, ensure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately. To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry. avoid dust , humidity , and temperature extremes. Do not place the product in any area where it may become wet. place the product on a stable surface. If you encounter technical problems with the product, contact a qualified service technician or your retailer.

Vi About this guide This user guide contains the information you need when installing and configuring the motherboard. How this guide is organized This guide contains the following parts: Â· This chapter describes the features of the motherboard and the new technology it supports. This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard. This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided. This chapter describes the contents of the support DVD that comes with the motherboard package and the software. This chapter describes how to install and configure multiple ATI® CrossFireXTM and NVIDIA® SLITM graphics cards. Chapter 5: Multiple GPU technology support Chapter 4: Software support Chapter 3: BIOS setup Chapter 2: Hardware information Chapter 1: Product introduction Â· Where to find more information Refer to the following sources for additional information and for product and software updates. Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer.

These documents are not part of the standard package. optional documentation ASUS websites 2. Vii Conventions used in this guide To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual. DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task. CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task. Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key. Example: <Enter> means that you must press the Enter or Return key. <Key1> + <Key2> + <Key3> If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). 0 support depends on the CPU types.

Com for Intel CPU support list Intel® Z77 Express Chipset 4 x DIMM, max.)/1600/1333/1066 MHz, non-ECC, un-buffered memory Dual channel memory architecture Supports Intel® Extreme Memory Profile (XMP) * Hyper DIMM support is subject to the physical characteristics of individual CPUs. 0 Gb/s ports (gray) with RAID 0, 1, 5, 10 support - 4 x SATA 3. 0 Gb/s ports (blue) with RAID 0, 1, 5, 10 support - Supports Intel® Smart Response Technology.

Intel® Rapid Start Technology, Intel® Smart Connect Technology* ASMedia® PCIe SATA 6Gb/s controller** - 2 x SATA 6Gb/s ports with port multiplier support * Supports on Intel® CoreTM processor family with Windows® 7 operating systems. Utility Realtek® ALC892 8-channel high definition audio CODEC - Absolute Pitch 192khz/24bit True BD Lossless Sound - DTS UltraPC II - DTS Connect - Supports jack-detection, multi-streaming and front panel jack-retasking - Optical S/PDIF out ports at back I/O 2 x ASMedia USB 3. 0 ports at midboard for front panel support (blue) - 2 x USB 3. 0 ports at midboard for front panel support (blue) - 2 x USB 3. ASUS unique features ASUS Dual Intelligent Processors 3- SMART DIGI+ Power Control: - Smart DIGI+ Key- quickly delivers higher VRM frequency, voltage and current for superior CPU/iGPU/DRAM overclocking performance with one switch. - Smart CPU Power Level (VRD 12. 5 Ready)- provides the best digital power saving conditions.

CPU Power - Industry leading digital 16-phase power design (12-phase for CPU, 4-phase for iGPU) - ASUS CPU Power Utility (continues on the next page) x P8Z77-V PRO specifications summary ASUS unique features DRAM Power - Industry leading Digital 2-phase DRAM Power Design - ASUS DRAM Power Utility ASUS EPU - EPU, EPU switch ASUS TPU - Auto Tuning, TurboV, GPU Boost, TPU switch ASUS Wi-Fi GO! Remote for portable Smartphone/Tablet, supporting iOS & Android systems - Wi-Fi Engine for network sharing and connection: Client Mode, Wi-Fi Direct, AP Mode ASUS Exclusive Features: - ASUS UEFI BIOS EZ Mode featuring friendly graphics user interface - Network iControl featuring instant network bandwidth domination for top network program in use - USB 3.



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ASUS Quiet Thermal Solution: - ASUS Fanless Design: Heatsink solution - ASUS Fan Xpert 2 featuring Fan Auto Tuning function for optimized speed control ASUS EZ DIY: - ASUS USB BIOS Flashback with USB BIOS Flashback Wizard for EZ BIOS download scheduling - ASUS UEFI BIOS EZ Mode featuring friendly graphics user interface - ASUS O. 4 cm) Support DVD contents Form factor *Specifications are subject to change without notice. Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below. 1. 2 Package contents Check your motherboard package for the following items. If any of the above items is damaged or missing, contact your retailer. The illustrated items above are for reference only. Actual product specifications may vary with different models. BIOS BIOS ASUS P8Z77-V PRO 1-1 Chapter 1 The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards! 1 Special features Product highlights LGA1155 Intel® 3rd/2nd Generation Core™ i7/Core™ i5/Core™ i3/ Pentium®/Celeron® Processors Chapter 1 1-2 This motherboard supports Intel® 3rd/2nd generation Core™ i7/i5/i3/Pentium®/Celeron® processors in the LGA1155 package, with iGPU, memory and PCI Express controllers integrated to support onboard graphics output with dedicated chipsets, 2-channel (4 DIMM) DDR3 memory and 16 PCI Express 3. This provides great graphics performance. Intel® 3rd/2nd generation Core™ i7/i5/i3/Pentium®/Celeron® processors are among the most powerful and energy efficient CPUs in the world. 0 ports for 10 times faster data retrieval speed. Moreover, Intel® Z77 Express Chipset can also enable iGPU function, letting users enjoy the latest Intel® integrated graphic performance. 0) is the latest PCI Express bus standard with improved encoding schemes that provide twice the performance of current PCIe 2.

0. Total bandwidth for a x16 link reaches a maximum of 32GB/s, double the 16GB/s of PCIe 2. 0 provides users unprecedented data speeds, combined with the convenience and seamless transition offered by complete backward compatibility with PCIe 1. 0 will become a must-have feature for users who wish to improve and optimize graphic performance, as well as have the latest technology available to them.) / 1600 / 1333 / 1066 MHz to meet the higher bandwidth requirements of the latest 3D graphics, multimedia, and Internet applications.

The dual-channel DDR3 architecture enlarges the bandwidth of your system memory to boost system performance. * Due to the behavior of Intel 2nd Generation Processor, DDR3 2200 and above/2000/1800 MHz memory module will run at DDR3 2133/1866/1600 MHz frequency as default. P8Z77-V PRO brings you the multi-GPU choice of either SLITM or CrossFireX. The motherboard features the most powerful Intel® Z77 platform to optimize PCIe allocation in multiple GPU configurations. Expect a brand-new gaming style you've never experienced before! Key benefits include reduced load and wait times, and lower power consumption through the elimination of unnecessary hard drive spin. This technology combines SSD performance with hard drive capacity, operating up to 6X faster than a hard drive-only system, and an important part of Green ASUS eco-friendly computing. * Intel® Smart Response Technology is supported by 3rd/2nd generation Intel® Core™ processor family on Windows® 7 operating systems. ** Operating systems must be installed on the HDD to launch Intel® Smart Response Technology. The capacity of the SSD is reserved for caching function. Intel® Rapid Start Technology Allows your computer to quickly resume from a low-power rogram sensor scenarios to design your own motion-based game! -Remote keyboard and mouse: sit back and control your computer by using your tablet's built-in QWERTY keyboard to type and click! 3.

DLNA streaming made easy: enjoy HD content, music and photos from the PC on your DLNA devices via Wi-Fi connectivity, the perfect match for creating your own home theater! 4. Easy file and screenshot transfers: send and share files and screen shots from your PC to smart devices directly with a touch over Wi-Fi. GPU Boost GPU Boost accelerates the integrated GPU for extreme graphics performance. the userfriendly interface facilitates flexible frequency adjustments. It easily delivers stable systemlevel upgrades for every use. 0 Boost technology, a USB device's transmission speed is significantly increased up to 170%, adding to an already impressive fast USB 3. 0 peripherals without the need for any user interaction. USB Charger+ With a dedicated onboard controller, quick-charge your USB devices such as iProducts smartphones, tablets and other portor accessing memory info, detecting faulty DIMMs and helping with difficult POST situations ASUS Q-Design ASUS Q-Design enhances your DIY experience. All of Q-LED, Q-Slot, and Q-DIMM design speed up and simplify the DIY process! ASUS Q-Shield The specially designed ASUS Q-Shield does without the usual "fingers" - making it convenient and easy to install. With better electric conductivity, it ideally protects your motherboard against static electricity and shields it against Electronic Magnetic Interference (EMI).

ASUS P8Z77-V PRO 1-7 Chapter 1 ASUS Q-Connector The ASUS Q-Connector allows you to connect or disconnect the chassis front panel cables in one easy step with one complete module. This unique adapter eliminates the trouble of plugging in one cable at a time, making the connection quick and accurate. Chapter 1 1-8 ASUS EZ-Flash 2 ASUS EZ Flash 2 is a user-friendly utility that allows you to update the BIOS without using a bootable floppy disk or an OS-based utility. 6 Other special features LucidLogix Virtu MVP LucidLogix Virtu MVP featuring HyperFormance™ Technology boosts your discrete graphics card up to 30% beyond its original performance. Designed for Intel® processor graphics and Windows® 7 PCs, it perfectly combines the performance of discrete graphics cards with fast computing iGPU.

Also with the newly designed Virtual Sync, users can enjoy a smoother gaming experience by eliminating tearing artifacts. LucidLogix Virtu MVP could also dynamically assign tasks to the best available graphics resource, based on power, performance and system load. This allows users to fully utilize 3x faster video conversion with Intel® Quick Sync Video 2. 0 technology while retaining high-end 3D rendering and gaming performance, provided by both NVIDIA® and AMD graphic cards. When the discrete graphics card is not required, it will put the power use down to near zero, making the system more environmentally-friendly.

For users searching for perfection, LucidLogix Virtu MVP provides great graphical performance and the best flexibility and efficiency.



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8 Gbps of bandwidth over standard cables, providing billions of colors and bi-directional communications, thus enabling the fastest refresh rates and the highest resolution digital display through a single cable. Also, it supports HDCP copy protection for Blu-ray Discs. Simply output 3D signals through the connected DisplayPort 1.1a cable with your 3D display, then you can sit back and enjoy a perfect 3D animation experience. HDMI 1.4a Support High-Definition Multimedia Interface (HDMI) is a set of digital video standards that delivers multi-channel audio and uncompressed digital video for full HD 1080p visuals and 3D animation through all high speed HDMI cable with 3D devices. Supporting HDCP copy protection such as HD DVD and Blu-ray Discs, HDMI provides you with the highest-quality home theater experience. Chapter 1: Product Introduction DTS UltraPC II DTS Connect To get the most out of your audio entertainment across all formats and quality levels, DTS Connect combines two enabling technologies. DTS Neo:PCM upmixes stereo sources (CDs, MP3s, WMAs, internet radio) into as many as 7.

1 channels of incredible surround sound. Consumers can then connect their PC to a home theater system. DTS Interactive is capable of performing multi-channel encoding of DTS bitstreams on personal computers, and sending encoded bitstreams out of a digital audio connection (such as S/PDIF or HDMI) designed to deliver audio to an external decoder. ErP Ready The motherboard is European Union's Energy-related Products (ErP) ready, and ErP requires products to meet certain energy efficiency requirement in regards to energy consumptions. This is in line with ASUS vision of creating environment-friendly and energy-efficient products through product design and innovation to reduce carbon footprint of the product and thus mitigate environmental impacts.

aSUS P8Z77-V PRO 1-9 Chapter 1 DTS UltraPC II delivers exceptional 5.1 surround through the most popular PC audio setups - your existing stereo speakers or headphones. In addition to virtual surround, it upgrades original sound to new levels with Audio Restoration, recreating the dynamic range of audio files. Symmetry mode improves the balance of perceived loudness across different input sources and Enhance boosts audio quality through high and low frequency equalization. With these technologies, users experience better home theater audio with ease.

chapter 1 1-10 Chapter 1: Product Introduction Chapter 2 Chapter 2: Hardware information 2.1 Before you proceed Take note of the following precautions before you install motherboard components or change any motherboard settings. Unplug the power cord from the wall socket before touching any component.

Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity. Hold components by the edges to avoid touching the ICs on them.

Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component. Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components. 10 Rear panel connection for more information about rear panel connectors and internal connectors. 2 Central Processing Unit (CPU) The motherboard comes with a surface mount LGA1155 socket designed for the Intel® 3rd/2nd Generation Core™ i7 /

Core™ i5 / Core™ i3 / Pentium / Celeron Processors.

Chapter 2 2-4 Ensure that all power cables are unplugged before installing the CPU. The LGA1156 CPU is incompatible with the LGA1155 socket. DO NOT install a LGA1156 CPU on the LGA1155 socket. Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related. Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA1155 socket. The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap. DO NOT install a DDR or DDR2 memory module to the DDR3 slot.

Recommended memory configurations Install one memory module in slot A2 first as a single-channel operation. ASUS P8Z77-V PRO 2-5 Chapter 2 Memory configurations You may install 1GB, 2GB, 4GB and 8GB unbuffered and non-ECC DDR3 DIMMs into the DIMM sockets. You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation. Due to Intel 2nd Generation processors' behavior, DDR3 2200 and above/2000/1800 MHz memory module will run at DDR3 2133/1866/1600 MHz frequency as default. According to Intel CPU spec, DIMM voltage below 1.65V is recommended to protect the CPU. Always install DIMMs with the same CAS latency. For optimum compatibility, we recommend that you obtain memory modules from the same vendor.

Due to the memory address limitation on 32-bit Windows OS, when you install 4GB or more memory on the motherboard, the actual usable memory for the OS can be about 3GB or less. For effective use of memory, we recommend that you do any of the following: - Use a maximum of 3GB system memory if you are using a 32-bit Windows OS. - Install a 64-bit Windows OS when you want to install 4GB or more on the motherboard. For more details, refer to the Microsoft® support site at <http://support>. This motherboard does not support DIMMs made up of 512Mb (64MB) chips or less (Memory chip capacity counts in Megabit, 8 Megabit/Mb = 1 Megabyte/MB).

The default memory operation frequency is dependent on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value. To operate at the vendor-marked or at a higher frequency, refer to section 3.4 Ai Tweaker menu for manual memory frequency adjustment. For system stability, use a more efficient memory cooling system to support a full memory load (4 DIMMs) or overclocking condition.

66 1 DIMM 2 DIMM 4 DIMM CORSAIR CMGTX8(XMP) CORSAIR CMGTX8(XMP) F3-19200CL9D-4GBPIS(XMP) DS DS DS DS Transcend TX2400KLU-4GK (381850)(XMP) 2GB PVV34G2400C9K(XMP) GOC316GB2400C10QC(XMP) 16GB (4x 4GB) DS 4GB (2x 2GB) * The memory modules in 2400MHz and above are supported on Intel 3rd Generation Processors by this motherboard; however, the actual frequency support varies depending on the O.



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65 * The memory modules in 2200MHz and above are supported on Intel 3rd Generation Processors by this motherboard; however, the actual frequency support varies depending on the O. 65 KINGSTON KHX2133C9AD3T1K2/4GX(XMP) KINGSTON KHX2133C9AD3T1K2/4GX(XMP) KINGSTON KHX2133C9AD3W1K2/4GX(XMP) KINGSTON KHX2133C9AD3X2K2/4GX(XMP) KINGSTON KHX2133C9AD3X2K2/4GX(XMP) Patriot PVV34G2133C9K(XMP) KINGSTON KHX2133C9AD3T1FK4/8GX(XMP) * The memory modules in 2133MHz and above are supported on Intel 3rd Generation Processors by this motherboard; however, the actual frequency support varies depending on the O. 65 - Silicon Power SP002GBLYU200S02(XMP) * The memory modules in 2000MHz and above are supported on Intel 3rd Generation Processors by this motherboard; however, the actual frequency support varies depending on the O. 65 F3-14900CL9Q-8GBFLD(XMP) 8GB (2x 4GB) 9-11-9-27 * The memory modules in 1866MHz and above are supported on Intel 3rd Generation Processors by this motherboard; however, the actual frequency support varies depending on the O. 6 * The memory modules in 1800MHz and above are supported on Intel 3rd Generation Processors by this motherboard; however, the actual frequency support varies depending on the O. 1 DIMM: Supports one (1) module inserted into any slot as Single-channel memory configuration. We suggest that you install the module into A2 slot. 4 DIMMs: Supports four (4) modules inserted into both the blue and black slots as two pairs of Dual-channel memory configuration. aSUS exclusively provides hyper DIMM support function.

2 DIMMs: Supports two (2) modules inserted into either the blue slots or the black slots as one pair of Dual-channel memory configuration. We suggest that you install the modules into slots A2 and B2 for better compatibility. Hyper DIMM support is subject to the physical characteristics of individual CPUs.

Settings in the BIOS for the hyper DIMM support. Visit the ASUS website for the latest QVL. 4 Expansion slots Ensure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components. 0 x16_1 x16 (Recommend for single VGA) x8 VGA configuration Single VGA/PCIe card Dual VGA/PCIe card PCIe 3. 0 support depends on CPU type and requires PCIe 3. 0 VGA card. In single VGA card mode, use the PCIe 3. 0/2. 0 x16_1 slot (navy blue) for a PCI Express x16 graphics card to get better performance. 0 x16_2 slots for PCI Express x16 graphics cards to get better performance. We recommend that you provide sufficient power when running CrossFireXTM or SLITM mode. refer to page 2-31 for details. Connect a chassis fan to the motherboard connector labeled CHA_FAN1/2/3/4 when using multiple graphics cards for better thermal environment. See page 2-30 for details. 5 Onboard switches Onboard switches allow you to fine-tune performance when working on a bare or open case system. This is ideal for overclockers and gamers who continually change settings to enhance system performance.

1. Installing DIMMs that are incompatible with the motherboard may cause system boot failure, and the DRAM_LED near the MemOK! Switch until the DRAM_LED starts blinking to begin automatic memory compatibility tuning for successful boot. 6 Onboard LEDs for the exact location of the DRAM_LED. The DRAM_LED also lights when the DIMM is not properly installed. Turn off the system and reinstall the DIMM before using the MemOK! During the tuning process, the system loads and tests failsafe memory settings. It takes about 30 seconds for the system to test one set of failsafe settings. If the test fails, the system reboots and test the next set of failsafe settings. The blinking speed of the DRAM_LED increases, indicating different test processes. Due to memory tuning requirement, the system automatically reboots when each timing set is tested. If the installed DIMMs still fail to boot after the whole tuning process, the DRAM_LED lights continuously.

Replace the DIMMs with ones recommended in the Memory QVL (Qualified Vendors Lists) in this user manual or on the ASUS website at www.asus.com. If you turn off the computer and replace DIMMs during the tuning process, the system continues memory tuning after turning on the computer. To stop memory tuning, turn off the computer and unplug the power cord for about 5-10 seconds. If your system fail to boot due to BIOS overclocking, press the MemOK! switch to boot and load BIOS default settings. A message will appear during POST reminding you that the BIOS has been restored to its default settings. We recommend that you download and update to the latest BIOS version from the ASUS website at www.asus.com. After using the MemOK! Turning this switch to Enable will automatically optimize the system for fast, yet stable clock speeds. For ensuring the system performance, turn the switch setting to Enable when the system is powered off. tPU switch - The TPU LED (O2LED1) near the TPU switch lights when the switch setting is turned to Enable.

6 Onboard LEDs for the exact location of the TPU LED. If you change the switch setting to Enable under the OS environment, the TPU function will be activated after the next system bootup. You may use the TurboV and Auto Tuning feature in the TurboV EVO application, adjust the BIOS setup program, or enable the TPU switch at the same time. However, the system will use the last setting you have made. Turning this switch to Enable will automatically detect the current PC loadings and intelligently moderate the power consumption.

For ensuring the system performance, turn the switch setting to Enable when the system is powered off. ePU switch Chapter 2 - The EPU LED (O2LED2) near the EPU switch lights when the switch setting is turned to Enable. 6 Onboard LEDs for the exact location of the EPU LED. If you change the switch setting to Enable under the OS environment, the EPU function will be activated after the next system bootup. You may change the EPU settings in the software application or BIOS setup program, and enable the EPU function at the same time.

However, the system will use the last setting you have made. Onboard LEDs The POST State LEDs of CPU, DRAM, VGA card, and HDD indicate key components status during POST (Power-on Self Test). If an error is found, the LED next to the error device will continue lighting until the problem is solved. This user-friendly design provides an intuitional way to locate the root problem within a second. pOST State LEDs 2. The motherboard comes with a standby power LED that lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED. standby power LED ASUS P8Z77-V PRO 2-15 Chapter 2 3. The TPU LED lights when the TPU switch is turned to Enable.

tPU LED Chapter 2 2-16 4. The EPU LED lights when the EPU switch is turned to Enable.



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7 Jumper Clear RTC RAM (3-pin CLRTC) This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5-10 seconds, then move the cap back to pins 1-2. Hold down the key during the boot process and enter BIOS setup to re-enter data. Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data.

After the CMOS clearance, reinstall the battery. You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values. Due to the chipset behavior, AC power off is required to enable C.

You must turn off and on the power supply or unplug and plug the power cord before rebooting the system. Turn OFF the computer and unplug the power cord. Plug the power cord and turn ON the computer. If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5, and 10 configuration with the Intel® Rapid Storage Technology through the onboard Intel® Z77 chipset. These connectors are set to [AHCI Mode] by default.

If you intend to create a Serial ATA RAID set using these connectors, set the SATA Mode item in the BIOS to [RAID Mode]. 4 RAID configurations or the manual bundled in the motherboard support DVD. When using NCQ, set the SATA Mode in the BIOS to [AHCI Mode]. You must install Windows® XP Service Pack 3 or later versions before using Serial ATA hard disk drives. The Serial ATA RAID feature is available only if you are using Windows® XP SP3 or later versions. If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5, and 10 configuration with the Intel® Rapid Storage Technology through the onboard Intel® Z77 chipset. These connectors are set to [AHCI Mode] by default. If you intend to create a Serial ATA RAID set using these connectors, set the SATA Mode item in the BIOS to [RAID Mode]. 4 RAID configurations or the manual bundled in the motherboard support DVD. When using NCQ, set the SATA Mode in the BIOS to [AHCI Mode].

You must install Windows® XP Service Pack 3 or later versions before using Serial ATA hard disk drives. The Serial ATA RAID feature is available only if you are using Windows® XP SP3 or later versions. The SATA6G_EI/E2 (navy blue) connectors are for data drives only. aTAPI device is not supported. You must install Windows® XP Service Pack 3 or later versions before using Serial ATA hard disk drives. When using NCQ, set the ASM1061 Storage Controller item in the BIOS to [Enabled]. This connector is for the additional USB 3.0 front panel cable is available from your system chassis, with this USB 3.0 connector, you can have a front panel USB 3.0 connector. This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s).

Connect the S/PDIF Out module cable to this connector, then install the module to a slot opening at the back of the system chassis. These connectors are for USB 2.0 ports. Connect the USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0.

Doing so will damage the motherboard! You can connect the front panel USB cable to the ASUS Q-Connector (USB, blue) first, and then install the Q-Connector (USB) to the USB connector onboard if your chassis supports front panel USB ports. CPU and chassis fan connectors (4-pin CPU_FAN; 4-pin CPU_OPT; 4-pin CHA_FAN1-4) Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector. Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. these are not jumpers! Do not place jumper caps on the fan connectors! The CPU_FAN connector supports the CPU fan of maximum 1A (12 W) fan power.

All the CPU and CHA fans support ASUS Fan Xpert 2 feature. If you install two VGA cards, we recommend that you plug the rear chassis fan cable to the motherboard connector labeled CHA_FAN1-4 for better thermal environment. aSUS P8Z77-V PRO 2-23 Chapter 2 8. This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 audio standard. Connect one end of the front panel audio I/O module cable to this connector. We recommend that you either a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability. If you want to connect a high-definition front panel audio module to this connector, set the Front Panel Type item in the BIOS setup to [HD]; if you want to connect an AC'97 front panel audio module to this connector, set the item to [AC97]. by default, this connector is set to [HD]. These connectors are for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation.

Find the proper orientation and push down firmly until the connectors completely fit. aTX power connectors (24-pin EATXPWR; 8-pin EATX12V) Chapter 2: Hardware information Â· For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 350 W. Do not forget to connect the 4-pin/8-pin EATX12 V power plug; otherwise, the system will not boot. Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate. If you want to use two or more high-end PCI Express x16 cards, use a PSU with 1000W power or above to ensure the system stability. If you are uncertain about the minimum power supply requirement for your system, refer to the Recommended Power Supply Wattage Calculator at <http://support.asus.com/PowerSupplyCalculator.aspx>. Model SUPER FLOWER SF-350P14XE GreatWall-ATX-350P4 Great Wall BTX-500GT THERMALTAKE TR2-RX-1200AH3CH ASUS U-75HA Be quiet BN073 Bubalus PE600WJD CoolerMaster RS-850EMBA CoolerMaster RS-A00-ESBA Delta GPS-550AB Gigabyte P610A-C2 GoldenField JHTS-S398 GoldenField ATX-S395 HECHUAN ST-ATX330 Huntkey R85 SAMA YUHUI-350P Seasonic SS-850EM Corsair CMPSU-850AX Seventeam ST-750P-AF Huntkey HK400-55AP EnerMAX EPM850EWT Silverstone SST-ST40F-ES FSP GROUP AX-310HHN Antec EA-430D Antec EA-750 GREATWALL-BTX-400SD DELUX-DLP-650PG HAMER MIT750 COOLERMATER RS-C00-80GA-D3 ENERMAX MAXREVO THERMALTAKE TR2 RX-650AL3CH THERMALTAKE TP-1050AH3CSG Segotep SG-400PYJ Centurystar ST-330 Wattage 350 350 400 1200 750 650 500 850 1000 550 610 350 500 450 350 850 850 750 300 850 400 310 430 750 300 450 750 1200 1300 650 1050 400 320 Â· This 2-pin connector is for the system power LED.



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Connect the chassis power LED cable to this connector.

The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode. This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD. This 4-pin connector is for the chassis-mounted system warning speaker.

The speaker allows you to hear system beeps and warnings. This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF. This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

Reset button (2-pin RESET) ATX power button/soft-off button (2-pin PWRSW) System warning speaker (4-pin SPEAKER) Hard disk drive activity LED (2-pin IDE_LED) System power LED (2-pin PLED) **1** Building your computer system Additional tools and components to build a PC system 1 bag of screws Philips (cross) screwdriver Intel LGA 1155 CPU Intel LGA 1155 compatible CPU Fan DIMM SATA hard disk drive SATA optical disc drive (optional) Graphics card (optional) The tools and components in the table above are not included in the motherboard package. 3 CPU heatsink and fan assembly installation Apply the Thermal Interface Material to the CPU heatsink and CPU before you install the heatsink and fan if necessary. To install the CPU heatsink and fan assembly 1 B A B 2 Chapter 2 2-30 A 3 4 Chapter 2: Hardware information To uninstall the CPU heatsink and fan assembly 1 2 B A B A ASUS P8Z77-V PRO 2-31 Chapter 2. 5 Motherboard installation The diagrams in this section are for reference only. The motherboard layout may vary with models, but the installation steps remain the same. 1 2 ASUS P8Z77-V PRO 2-33 Chapter 2 3 Chapter 2 DO NOT overtighten the screws! Doing so can damage the motherboard. 11 b/g/n Ensure to disconnect the power supply unit from the motherboard before installing/uninstalling the Wireless Module. 1. Unfasten screw B from the Wireless Module. b BIOS BIOS BIOS BIOS 3.

Be sure to secure the Module to the motherboard by properly fastening screw B from underneath the motherboard. The module MUST be screwed to the motherboard to avoid loosening during use. Handle the screwdriver with care to avoid scratching the motherboard and causing defects. Align the Module to the WLAN connector (the second item at the motherboard back IO area). Connect the pins and make sure the screw hole matches the hole on the motherboard. Attach the IO shield onto the computer chassis, and place the motherboard flatly into the chassis. Locate from the exterior IO area of the computer chassis the lower connecting jack of the Module and attach the Wi-Fi Ring Moving Antenna. A click can be heard when the antenna connector is fully inserted. Give a slight pull to make sure installation is complete. Fasten the screws onto the motherboard.

11 USB BIOS Flashback USB BIOS Flashback offers the most convenient way to flash the BIOS. It allows overclockers to try new BIOS versions easily without having to enter their existing BIOS or operating system. Just plug in USB storage and push the dedicated button for 3 seconds, and the BIOS is automatically flashed using standby power. worry-free overclocking for the ultimate convenience! USB BIOS Flashback Button 1 2 3 4 5 6 Download the USB BIOS Flashback wizard from the ASUS service website (www. Save it to a USB portable disk, and place it in the root directory.

Press the USB BIOS Flashback button for 3 seconds, and the light will begin to flash (on the third second). The Flashback function is enabled once the light starts to flash. BIOS update is complete once the light signal goes out. The flashing rate of the light signal accelerates along with the updating speed. Plug the USB flash drive into the bottom port of LAN1_USB3_12 connector in back I/O.

1. Do not unplug portable disk, power system, or press the CLR_CMOS button while BIOS update is ongoing, otherwise update will be interrupted. In case of interruption, please follow the recommended procedures again to complete BIOS update. If the light flashes for five seconds and turns into a stable lighting, this means that the USB BIOS Flashback is not operating properly. If this is the case, please restart the system to turn off the light. updating BIOS may have risks. If the BIOS program is damaged during the process causing the system unable to reboot, please contact the local service station for help. The two USB ports support USB Charger+ and USB BIOS Flashback. 2-42 Chapter 2: Hardware information **1** This motherboard comes with multiple VGA output that features desktop extension on two monitors. You can connect two monitors to any two of the onboard VGA, DVI-D, HDMI and DisplayPort ports.

DVI-D can not be converted to output RGB signal to CRT and is not compatible with DVI-I. uSB 3. 0 devices can only be used as data storage only. 0 ports for faster and better performance for your USB 3. 0 devices. To play Blu-Ray Disc, make sure to use an HDCP compliance monitor. due to XCHI controller structure, please manually install your USB3. 0 driver twice when installing the operating system from the USB3. Install Intel Graphics Accelerator Driver from the motherboard support DVD. From the Windows® notification area, doubleclick the Intel(R) Graphics Media Accelerator Driver icon and click Graphics Properties.

Move the Horizontal Scaling and Vertical Scaling sliders and then click Apply. 1 channel Speakers When the DTS UltraPC II function is enabled, ensure to connect the rear speaker to the gray port. Starting up for the first time After making all the connections, replace the system case cover. Be sure that all switches are off. Connect the power cord to the power connector at the back of the system chassis.

Connect the power cord to a power outlet that is equipped with a surge protector. Turn on the devices in the following order: a. Monitor External SCSI devices (starting with the last device on the chain) System power 6. After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button.

If your monitor complies with the "green" standards or if it has a "power standby" feature, the monitor LED may light up or change from orange to green after the system LED turns on. BIOS Beep One short beep One continuous beep followed by two short beeps then a pause (repeated) One continuous beep followed by three short beeps One continuous beep followed by four short beeps 7. Description VGA detected Quick boot set to disabled No keyboard detected No memory detected No VGA detected Hardware component failure At power on, hold down the <Delete> key to enter the BIOS Setup.



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5 Turning off the computer While the system is ON, pressing the power switch for less than four seconds puts the system on sleep mode or soft-off mode, depending on the BIOS setting. Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting. ASUS P8Z77-V PRO 2-47 Chapter 2 The system then runs the power-on self tests or POST. While the tests are running, the BIOS beeps (refer to the BIOS beep codes table below) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance. chapter 2 2-48 Chapter 2: Hardware information Chapter 3 Chapter 3: 3.

1 Knowing BIOS BIOS setup The ASUS UEFI BIOS offers a user-friendly interface that goes beyond traditional keyboard-only BIOS controls to enable more flexible and convenient mouse input. Users can easily navigate the UEFI BIOS with the same smoothness as their operating system. The term "BIOS" in this user manual refers to "UEFI BIOS" unless otherwise specified. BIOS (Basic Input and Output System) stores system hardware settings such as storage device configuration, overclocking settings, advanced power management, and boot device configuration that are needed for system startup in the motherboard CMOS. In normal circumstances, the default BIOS settings apply to most conditions to ensure optimum performance. We recommend that you not change the default BIOS settings except in the following circumstances:

- An error message appears on the screen during the system bootup and requests you to run the BIOS Setup. You have installed a new system component that requires further BIOS settings or update. Inappropriate settings of the BIOS may result to instability or failure to boot. We strongly recommend that you change the BIOS settings only with the help of a trained service personnel. When you start up the computer, the system provides you with the opportunity to run this program.

Press during the Power-On Self-Test (POST) to enter the Setup utility. Otherwise, POST continues with its test routines. If you wish to enter Setup after POST, press <Ctrl> + <Alt> + <Delete>, or press the reset button on the system chassis to restart the system. You can also turn the system off and then turn it back on to restart the system. Do this last option only if the first two failed.

The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen. Ensure that a USB mouse is connected to your motherboard if you want to use the mouse to control the BIOS setup program. If the system becomes unstable after changing any BIOS setting, load the default settings to ensure system compatibility and stability. Select the Load Optimized Defaults item under the Exit menu. If the system fails to boot after changing any BIOS setting, try to clear the CMOS and reset the motherboard to the default value.

8 Jumper for information on how to erase the RTC RAM. • The BIOS setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various submenus and select from the available options using a keyboard or a USB mouse. The BIOS setup program can be used under two modes: EZ Mode and Advanced Mode. You can change modes from the Exit menu or from the Exit/Advanced Mode button in the EZ Mode/Advanced Mode screen. 1 EZ Mode By default, the EZ Mode screen appears when you enter the BIOS setup program. The EZ Mode provides you an overview of the basic system information, and allows you to select the display language, system performance mode and boot device priority. To access the Advanced Mode, click Exit/Advanced Mode, then select Advanced Mode or press F7 hot key for the advanced BIOS settings. The default screen for entering the BIOS setup program can be changed. Selects the display language of the BIOS setup program Displays the CPU/motherboard temperature, CPU/5V/3.

3V/12V voltage output, CPU/chassis/power fan speed Clicks to display all fan speeds if available Exits the BIOS setup program without saving the changes, saves the changes and resets the system, or enters the Advanced Mode Chapter 3 Quick switch to Shortcut Selects the boot device priority Quick switch to

Advanced Mode Normal mode Power Saving mode Selects the boot device priority Loads optimized default ASUS Optimal mode Displays the system properties of the selected mode on the right hand side • The boot device options vary depending on the devices you installed to the system. The Boot Menu(F8) button is available only when the boot device is installed to the system. 2 Advanced Mode The Advanced Mode provides advanced options for experienced end-users to configure the BIOS settings. The figure below shows an example of the Advanced Mode. Refer to the following sections for the detailed configurations. To access the Advanced Mode, click Exit, then select Advanced Mode. Submenu item Pop-up window Scroll bar Navigation keys Menu bar The menu bar on top of the screen has the following main items: Main Ai Tweaker Advanced Monitor Boot Tool Exit For changing the basic system configuration For changing the overclocking settings For changing the advanced system settings For displaying the system temperature, power status, and changing the fan settings. For changing the system boot configuration For configuring options for special functions For selecting the exit options and loading default settings ASUS P8Z77-V PRO 3-3 Chapter 3 : Select Screen : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Shortcut F5: Optimized Defaults F10: Save ESC: Exit F12: Print Screen Menu items The highlighted item on the menu bar displays the specific items for that menu. For example, selecting Main shows the Main menu items.

The other items (Ai Tweaker, Advanced, Monitor, Boot, Tool, and Exit) on the menu bar have their respective menu items. Back button This button appears when entering a submenu. Press <Esc> or use the USB mouse to click this button to return to the previous menu screen. Submenu items A greater than sign (>) before each item on any menu screen means that the item has a submenu. To display the submenu, select the item and press <Enter>.

Pop-up window Select a menu item and press <Enter> to display a pop-up window with the configuration options for that item. Scroll bar A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen. Navigation keys At the bottom right corner of the menu screen are the navigation keys for the BIOS setup program.



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Use the navigation keys to select items in the menu and change the settings.

Chapter 3 3-4 General help At the top right corner of the menu screen is a brief description of the selected item. Use <F12> key to capture the BIOS screen and save it to the removable storage device. Configuration fields These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable. A configurable field is highlighted when selected. To change the value of a field, select it and press <Enter> to display a list of options. chapter 3: BIOS setup 3. 3 Main menu The Main menu screen appears when you enter the Advanced Mode of the BIOS Setup program. The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.

1178 02/B0 Choose the system default language 3400 MHz 1024 MB (DDR3) 1333 MHz English [Fri 11/08/2011] [16:46:15] Administrator Security The Security menu items allow you to change the system security settings. EFI BIOS Utility - Advanced Mode Exit Main Back Ai Tweaker Main\ Security > Advanced Monitor Boot Tool Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights Administrator Password User Password Administrator Password User Password Not Installed Not Installed To clear the administrator password, key in the current password in the Enter Current Password box, and then press <Enter> when prompted to create/confirm the password. â If you have forgotten your BIOS password, erase the CMOS Real Time Clock (RTC) RAM to clear the BIOS password. 7 Jumper for information on how to erase the RTC RAM. The Administrator or User Password items on top of the screen show the default Not Installed. After you set a password, these items show Installed. â ASUS P8Z77-V PRO 3-5 Chapter 3 Administrator Password If you have set an administrator password, we recommend that you enter the administrator password for accessing the system. Otherwise, you might be able to see or change only selected fields in the BIOS setup program. Confirm the password when prompted.

From the Create New Password box, key in a password, then press <Enter>. To change an administrator password: From the Enter Current Password box, key in the current password, then press <Enter>. Confirm the password when prompted. select the Administrator Password item and press <Enter>. From the Create New Password box, key in a new password, then press <Enter>.

To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the Administrator Password item on top of the screen shows Not Installed. User Password If you have set a user password, you must enter the user password for accessing the system. The User Password item on top of the screen shows the default Not Installed. After you set a password, this item shows Installed.

Confirm the password when prompted. From the Create New Password box, key in a password, then press <Enter>. To change a user password: From the Enter Current Password box, key in the current password, then press <Enter>. Confirm the password when prompted. select the User Password item and press <Enter>. From the Create New Password box, key in a new password, then press <Enter>. To clear the user password, follow the same steps as in changing a user password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the User Password item on top of the screen shows Not Installed. chapter 3: BIOS setup 3. 4 Ai Tweaker menu Be cautious when changing the settings of the Ai Tweaker menu items.

Incorrect field values can cause the system to malfunction. The configuration options for this section vary depending on the CPU and DIMM model you installed on the motherboard. The Ai Tweaker menu items allow you to configure overclocking-related items. Scroll down to display the following items: ASUS P8Z77-V PRO 3-7 Chapter 3 Ai Overclock Tuner [Auto] [Auto] [Manual] [X.] Allows you to select the CPU overclocking options to achieve the desired CPU internal frequency. Select any of these preset overclocking configuration options: Loads the optimal settings for the system. allows you to individually set overclocking parameters. If you install memory modules supporting the eXtreme Memory Profile (X.) Technology, choose this item to set the profiles supported by your memory modules for optimizing the system performance. The following two items appear only when you set the Ai Overclocking Tuner to [Manual].

BCLK/PCIE Frequency [XXX] Allows you to adjust the CPU and VGA frequency to enhance the system performance. Use the <+> and <-> keys to adjust the value. You can also key in the desired value using the numeric keypad. The values range from 80. EXtreme Memory Profile This item appears only when you set the Ai Overclocking Tuner item to [X.

] and allows you to select the X. Configuration options: [Profile #1] [Profile #2] Turbo Ratio [Auto] Allows you to set the CPU ratio automatically or manually. [Auto] Sets all Turbo Ratio to Intel® CPU default settings automatically. [Manual] Sets the Turbo Ratio for every core-activation condition of a full unlocked CPU manually. When the Turbo Ratio is set to [Manual], the following item appears: Ratio Synchronizing Control [Enabled] Chapter 3 3-8 [Enabled] Allows you to set an individual Turbo Ratio for every core-activation condition [Disabled] Allows you to set one single Turbo Ratio for all core-activation conditions.

1-Core Ratio Limit [Auto] Allows you to set the 1-Core Ratio Limit [Auto] Select to apply the CPU default Turbo Ratio setting [Manual] Select to to manually assign a 1-Core Ration Limit value that is higher than or equal to the 2-Core Ratio Limit. 2-Core Ratio Limit [Auto] Allows you to set the 2-Core Ratio Limit [Auto] Select to apply the CPU default Turbo Ratio setting [Manual] Select to to manually assign a 2-Core Ratio Limit value that is higher than or equal to the 3-Core Ratio Limit. 1-Core Limit must not be set to [Auto] 3-Core Ratio Limit [Auto] Allows you to set the 3-Core Ratio Limit [Auto] Select to apply the CPU default Turbo Ratio setting [Manual] Select to to manually assign a 3-Core Ratio Limit value that is higher than or equal to the 4-Core Ratio Limit. 1-Core/2-Core Ratio Limit must not be set to [Auto] Chapter 3: BIOS setup 4-Core Ratio Limit [Auto] Allows you to set the 4 Core Ratio Limit [Auto] Select to apply the CPU default Turbo Ratio setting [Manual] Select to to manually assign a 4-Core Ratio Limit value that is higher than or equal to the 3-Core Ratio Limit.



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1-Core/2-Core/3-Core Limit must not be set to [Auto] Internal PLL Overvoltage [Auto] Memory Frequency [Auto] Allows you to set the internal PLL voltage. Configuration options: [Auto] [Enabled] [Disabled] Allows you to set the memory operating frequency. The configuration options vary with the BCLK/PCIE Frequency item settings. iGPU Max. Frequency [Auto] Use the <+> and <-> keys to adjust the value. The values range from 900MHz to 3000MHz with a 50MHz interval.

EPU Power Saving Mode [Disabled] Allows you to enable or disable the EPU power saving function. Configuration options: [Disabled] [Enabled] EPU Setting [Auto] This item appears only when you set the EPU Power Saving MODE item to [Enabled.] and allows you to select the EPU power saving mode. Configuration options: [Auto] [Light Power Saving Mode] [Medium Power Saving Mode] [Max Power Saving Mode] OC Tuner automatically overclocks the frequency and voltage of CPU and DRAM for enhancing the system performance. Configuration options: [OK] [Cancel] DRAM Timing Control The sub-items in this menu allow you to set the DRAM timing control features. Use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key. Changing the values in this menu may cause the system to become unstable! If this happens, revert to the default settings. CPU Power Management CPU Ratio [Auto] The sub-items in this menu allow you to set the CPU ratio and features. Allows you to manually adjust the maximum non-turbo CPU ratio.

Use <+> and <-> keys to adjust the value. The valid value ranges vary according to your CPU model. ASUS P8Z77-V PRO 3-9 Chapter 3 OC Tuner Enhanced Intel SpeedStep Technology [Enabled] Allows you to enable or disable the Enhanced Intel® SpeedStep Technology (EIST). [Disabled] Disables this function. [Enabled] The operating system dynamically adjusts the processor voltage and core frequency which may result in decreased average consumption and decreased average heat production.

Turbo Mode [Enabled] Allows you to enable your core processor's speed to run faster than the marked frequency in a specific condition. Configuration options: [Disabled] [Enabled] Long Duration Power Limit [Auto] Long Duration Maintained [Auto] Use the <+> and <-> keys to adjust the value. Use the <+> and <-> keys to adjust the value. Short Duration Power Limit [Auto] Use the <+> and <-> keys to adjust the value. Primary Plane Current Limit [Auto] Maximum instantaneous current allowed at any given time for CPU cores Use <+> and <-> key to adjust the value at 0.

Secondary Plane Current Limit [Auto] Maximum instantaneous current allowed at any given time for Internal Graphics cores. Use <+> and <-> key to adjust the value at 0. The CPU working voltage will decrease proportionally to CPU loading. Higher value gets a higher voltage and better overclocking performance, but increases the CPU and VRM thermal. This item allows you to adjust the voltage range from the following percentages to boost the system performance: 0% (Regular), 25% (Medium), 50% (High), 75% (Ultra High) and 100% (Extreme). Configuration options: [Auto] [Regular] [Medium] [High] [Ultra High] [Extreme] The actual performance boost may vary depending on your CPU specification. Chapter 3 3-10 CPU Voltage Frequency [Auto] Frequency switching affects the VRM transient response, and the thermal component. Higher frequency gets quicker transient response. Configuration options: [Auto] [Manual] DO NOT remove the thermal module when switching to Manual Mode. The thermal conditions should be monitored.

Chapter 3: BIOS setup VRM Spread Spectrum [Disabled] This item appears only when you set the Frequency item to [Auto] and allows you to enable the spread spectrum to enhance system stability. CPU Power Phase Control [Auto] Allows you to control the power phase based on the CPU's demands. Configuration options: [Auto] [Standard] [Optimized] [Extreme] [Manual Adjustment] DO NOT remove the thermal module when switching to Extreme and Manual Mode. The thermal conditions should be monitored. cPU Power Duty Control [T. Probe] DIGI + VRM Duty control adjusts the current and thermal conditions of every component's phase. CPU Current Capability [100%] Allows you to configure the total power range, and extends the overclocking frequency range simultaneously. Configuration options: [100%] [110%] [120%] [130%] [140%] Choose a higher value when overclocking, or under a high CPU loading for extra power support. iGPU Load-line Calibration [Auto] iGPU Current Capability [100%] Allows you to set the iGPU Current Capability. Configuration options: [100%] [110%] [120%] [130%] [140%] Do not remove the thermal module while changing the DIGI+ VRM related parameters. The thermal conditions should be monitored. Some of the following items are adjusted by typing the desired values using the numeric keypad and press the <Enter> key. You can also use the <+> and <-> keys to adjust the value. To restore the default setting, type [auto] using the keyboard and press the <Enter> key. DRAM Current Capability [Auto] A higher value brings a wider total power range, and extends the overclocking range simultaneously.

Configuration options: [100%] [110%] [120%] [130%] ASUS P8Z77-V PRO 3-11 Chapter 3 Allows you to set the iGPU Load-line Calibration. Configuration options: [Auto] [Regular] [High] [Extreme] DRAM Voltage Frequency [Auto] Allows you to adjust the DRAM switching frequency. Assign a fixed high DRAM frequency to increase the O. c. Range, or a low DRAM frequency for a better system stability.

Configuration options: [Auto] [Manual] DRAM Power Phase Control [Auto] [Auto] [Optimized] [Extreme] Allows you to set the Auto mode. Allows you to set the ASUS optimized phase tuning profile. Allows you to set the full phase mode. DRAM Power Thermal Control [110] A higher temperature brings a wider DRAM power thermal range, and extends the overclocking tolerance to enlarge the O. Use the <+> and <-> keys to adjust the value. The values range from 110 to 131. DO NOT remove the thermal module. The thermal conditions must be monitored. CPU Voltage [Offset Mode] [Manual Mode] [Offset Mode] Offset Mode Sign [+] Allows you to set a fixed CPU voltage. Allows you to set the Offset voltage.

This item appears only when you set the CPU Voltage item to [Offset Mode]. CPU Offset Voltage [Auto] This item appears only when you set the CPU Voltage item to [Offset Mode] and allows you to set the Offset voltage. The values range from 0. Chapter 3 3-12 iGPU Voltage [Offset Mode] [Manual Mode] Offset Mode] [+] [-] Allows you to set a fixed iGPU voltage. Allows you to set the offset voltage. iGPU Offset Voltage [Auto] Allows you to set the iGPU Offset voltage. The values range from 0. DRAM Voltage [Auto] Allows you to set the DRAM voltage. The values range from 1.



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